

# SOLUTIONS



University of Maryland at College Park • College of Agriculture and Natural Resources

## Composting

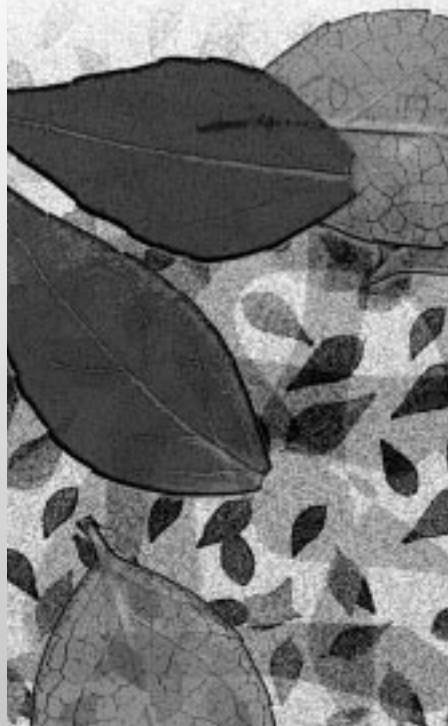
***Composting is a "live" process in which bacteria, fungi, and other beneficial microbes decompose organic matter and leave a product that is nutrient-rich and can be returned to the soil. The process occurs naturally but can be hastened and refined if the proper conditions and ingredients—particularly carbon, nitrogen, oxygen, and moisture—are available.***

***Although the composting process has been used for centuries, popular interest in it increased in the 1970's and 1980's as people sought waste-processing alternatives to landfills, ocean dumping, and incineration. Urban and rural areas alike face disposal problems, and composting provides the means for recycling kitchen, yard, farm, and even some commercial waste.***

***The College of Agriculture and Natural Resources is taking on the challenge of education and innovation to make composting commonplace in the 21st century.***

## Making a Difference

**T**he College of Agriculture and Natural Resources fosters composting research and then transfers research findings through educational programs for a range of audiences, including students, homeowners, farmers, and commercial food processors.



## Recycling by the Yard

In Maryland's urban environment, yard debris makes up 20 percent of our waste stream! Educational programs on backyard composting are paramount as landfills reach capacity and residents face the prospect of special taxes on yard-waste disposal.

In response to this increasing demand, Maryland Master Gardener and Master Composter volunteers, trained by Cooperative Extension Service professionals, operate eight composting demonstration sites across Central Maryland educating thousands of residents through composting in action. These demonstrations, in addition to workshops, presentations, and site visits conducted by Extension staff and volunteers, are provided in cooperation with county and city public works departments.

## Garbage In, Garden Out

Sewage sludge, leaves, grass clippings, and other yard debris, and agricultural and food-processing wastes can all be converted into marketable forms of compost. Recent findings by College of Agriculture and Natural Resources horticulturists indicate that municipal solid waste (that is, common garbage) may soon join the list of refuse that can be composted.

More than 80 percent of our garbage is paper. By fine-tuning the ratio of carbon, nitrogen, and phosphorous needed to break down everyday garbage, researchers have discovered that they can produce a compost with the physical characteristics and appearance of that much-loved gardening staple peat moss. At present, peat moss is imported from Canada. A renewable, locally produced replacement for this landscape-enhancing product would be a boon to many gardeners.

Current research at the College clearly indicates that compost can replace peat moss in soils and can substantially reduce the amount of peat moss needed for container-grown plants. Compost supplies many of the nutrients essential for plant growth, thereby reducing dependency on chemical fertilizers. The use of compost in place of commercial fertilizers reduces surface and ground water pollution. Research has shown that compost applications control certain soil-borne diseases and nematodes.

### **Bringing Worms to School**

Master Gardeners have brought exciting presentations on indoor redworm composting to hundreds of Howard County elementary and middle school students since 1994. Through hands-on experience with this fascinating form of natural recycling, students learn about composting and the environment. Presentations inspire some students to create videos and worm composting bins in their schools. In addition to gaining a greater understanding of the

world around them, the students do a great job of educating their parents on environmental issues. Thanks to research and education, composting will be a "natural" way of life to our next generation of adults.

### **Poultry Power**

The Delmarva broiler industry produced 623 million birds in 1995. Broiler production generates the largest gross income of any agricultural industry in Delaware or Maryland. The great number of birds produced creates many opportunities for recycling by-products from broiler production and processing. An international industry with its origin in Maryland, poultry composting technology is being utilized by about 53 percent of the State's broiler producers.

Scientists in the Department of Biological Resources Engineering have determined that mixtures of products high in nitrogen such as hatchery byproducts, broiler litter, poultry carcasses, dissolved air flotation skimmings (consisting of fine organic particles, oils and fats) and manure with high carbon sources such as wood shavings, sawdust, and straw will all produce viable composts. Each of these compost recipes reduces the amount of production refuse through recycling and returns richness to the land.

### **Compost Power**

The College is laying the groundwork for the next generation of compost research. Throughout 1994 and 1995, graduate students in the Department of Natural Resource Sciences and Landscape Architecture had considerable success composting

municipal and agricultural wastes.

As part of their graduate research, students composted municipal solid waste compost (common garbage) and applied it to crops growing on test plots at the Wye Research and Education Center. Participants recorded statistically significant increases in yields of beans, broccoli, cantaloupe, and tomatoes. Furthermore, applications of municipal solid waste compost reduced the amount of soluble nitrates (from fertilizer applications) in the top 6 inches of soil, thereby decreasing the amount of fertilizer available for leaching into local waters and eventually the Chesapeake Bay. The success of this research shows composting to be a viable and environmentally friendly alternative to the disposal of waste that would otherwise sit in a landfill.

In a separate graduate research project, poultry litter compost applied to poinsettias proved to be the best source of nutrients for these holiday plants. Compost made from poultry waste was found to be equivalent to the best commercial growing media and outperformed those made from biosolids, municipal solid waste, crab waste, and other materials. Without a doubt, academic achievement blooms in the College of Agriculture and Natural Resources.

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